

1. What are 4 components of a galvanic cell?
2. What are 6 different ways to prevent corrosion?

3. a) Determine the P-B ratio for vanadium oxide, V_2O_5 on vanadium.

Given: $P - B = \frac{A_o \rho_m}{a A_m \rho_o}$

Vanadium density, ρ_m , = 6.0 g/cm³

V_2O_5 density, ρ_o , = 3.36 g/cm³

atomic mass of vanadium, A_m = 50.942 g/mol

atomic mass of V_2O_5 , A_o = 181.884 g/mol

a = the number of vanadium atoms in on molecule of the oxide, V_2O_5

b) Is vanadium oxide, V_2O_5 , protective for vanadium?

4. In an experiment iron in placed in water in contact with copper for 7 weeks. At the end of the experiment the iron has lost 1.9 grams of mass.

$$\text{mils per year} = \text{mpy} = \frac{534W}{DA_t}$$

Density of iron: 7.87 g/cm³

Surface area of iron: 4 in²

Density of copper 8.96 g/cm³

Surface area of copper 5 in²

where: 1 mil = 10⁻³ in

W = mass lost (mg)

D = specimen density (g/ cm³)

A = specimen area (in²)

t = exposure time (hr)

a) Use the given information to determine the corrosion rate of this system in mils per year.

b) which is the anode in this system?